REMARKS

Claims 1-15 remain in this application, and Claims 1 and 14 have been amended. The Applicants respectfully request reconsideration and review of the application as amended above in light of the following remarks.

The Examiner objected to the specification because the number "189" on page 11, line 1, should be "180." The Applicants have changed the number "189" to "180" and, therefore, request the Examiner to remove this objection.

The Examiner rejected Claims 12-15 as indefinite under 35 U.S.C. § 112, second paragraph. The Applicants respectfully traverse this rejection.

The Applicants are required to define the subject matter with a reasonable degree of particularity and distinctness to apprise the scope of the invention to one of ordinary skill in the art. See M.P.E.P. § 2173.02 at 2100-194 (emphasis in original). When determining whether the Applicants have defined the subject matter with a reasonable degree of particularity, the Examiner must at least consider the content of the application disclosure, the teachings of the prior art, and the claim interpretation that would be given by one possessing the ordinary level of skill in the pertinent art at the time the invention was made. Id.

The Examiner states that the phrase "a signal layer operably coupled to the ground layer" of Claim 12 is not clearly understood and that Claim 1 is therefore indefinite. The Applicants traverse this rejection. One of ordinary skill in the art would interpret the objected to phrase to cover both a signal layer that is directly connected to the ground layer and a signal layer that is indirectly connected to the ground layer, i.e., a circuit board in which the signal layer is connected to one or more intermediate elements, one of which intermediate elements is connected to the ground layer. See also Johnson Worldwide Assoc., Inc. v. Zebco Corp., 175 F.3d 985, 992 (Fed. Cir. 1999) (recognizing that the term "coupled" has been construed as a broad term that "generally describes a connection."). The Applicants submit that the phrase as originally drafted is clearly comprehensible and, therefore, submit that Claims 12 and

Claims 13-15, which depend from Claim 12, are definite. The Applicants request that the Examiner withdraw this rejection.

Before addressing the merits of the rejections based on prior art, the Applicants provide the following brief description of the invention. A first embodiment of the invention is directed to reducing electromagnetic interference (EMI) emanating from a computer enclosure. Computer enclosures are often divided into two compartments, i.e., a source compartment and an unshielded compartment. The source compartment contains a primary source of EMI, such as a computer processing unit (CPU), and is configured to prevent excessive EMI from emanating outside of the enclosure. The unshielded compartment contains components, such as disk drive components that have doors and/or openings formed therein. These components may permit EMI to leak from the enclosure through the openings formed within the components. The source compartment is typically separated from the unshielded compartment by a middle frame member ("midframe") and a riser card, and in some configurations, only a riser card. Riser cards typically have peripheral port sockets that face the unshielded compartment, and a cable is oftentimes plugged into the port sockets and connected to the component, such as the disk drive discussed above. The peripheral port sockets are connected to the source compartment by traces that pass through vias that are formed within the riser card. The traces are usually formed on a signal layer of the riser card, and undesirably act as antennae that receive EMI from the source compartment. The EMI is conducted from the traces to the port socket, through the cable, into the component, and eventually through the door of the component, until the EMI emanates to outside of the enclosure.

In the first embodiment of the invention, a riser card includes a ground layer that is interposed between the signal layer and the source compartment. The ground layer is positioned so that it covers the traces on the signal layer and the vias that the traces run through. Thus, the ground layer of the riser card reduces the amount of EMI transmitted by the EMI sources within the source compartment that is received by the

traces, and the amount of EMI that is emanated from the enclosure is reduced.

The Examiner rejected Claims 1-11 under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 5,586,011 by Alexander ("Alexander"). The rejection is respectfully traversed.

Alexander is directed to a method for grounding a circuit board having internal ground (GND), power (PWR) and signal (SIG) layers by providing for electrical communication between the internal ground layers and a metal plating on the surface of the circuit board. The ground layers (GND) of Alexander are in electrical communication with metal vias (45), which are in electrical communication with metal plating (40) on the surface of the Alexander circuit board. Thus, the metal plating on the surface of the circuit board is in electrical communication with the ground layers.

Alexander also provides for a plurality of metal plated vias (55) formed within the ground (GND), power (PWR) and signal (SIG) layers of the circuit board. The metal plated vias (55) are in electrical communication with traces on the signal layers and with metal pads (51). The metal plated pads (51) are formed along top and bottom surfaces of the circuit board. Thus, the traces on the signal layer are in electrical communication with the metal pads (51) on the surface of the board, allowing the signal layers to be in electrical contact with components, including EMI emanating components, that are on the surface of the circuit board. The ground layers also include metal plated vias (45) at the same locations where the traces of the signal layer are in electrical communication with the metal plated vias (55) and, therefore, do not cover traces of the signal layers along portions where the traces are in electrical communication with the metal plated vias and the metal pads. (See 51 and 55 of Fig. 3.)

Claim 1, on the other hand, states that "one of the at least three ground layers is positioned . . . **to cover the via and substantially all of the trace that is in electrical communication with the device** in the unshielded compartment when the riser card is mounted in the computer enclosure." (Emphasis added.) By including ground layers that cover the via and the trace along portions where the trace is in electrical

communication with the device, riser cards of Claim 1 reduce EMI originating from an EMI source within the source compartment from being received by the device in the unshielded compartment. As a result, the amount of EMI originating from the source compartment, conducted through traces to the device within the unshielded compartment and out of the enclosure will be reduced.

Because circuit boards of Alexander do not include ground layers that cover the via and substantially all of the trace that is in electrical communication with the device, if the circuit boards of Alexander were used as riser cards, they would not effectively reduce EMI originating from the source compartment from being received by a device in the unshielded compartment. Indeed, if an EMI emanating component were connected to a pad (51) of Alexander, EMI emanating from the component would be transmitted directly to the signal layer and to a pad on the other side of the Alexander circuit board—unimpeded by a ground layer. The EMI would, thus, be transmitted into the unshielded compartment and emanate out of the enclosure.

The Alexander circuit board does not include the claimed feature because there is no need for the circuit board disclosed in Alexander to reduce EMI transmission from one compartment to another. Circuit boards are typically oriented in a horizontal position and therefore divide an enclosure into top and bottom compartments. The components emitting EMI are typically provided in the top compartment, and there is typically no opening in the bottom compartment. Thus, there is no need to stop EMI from being transmitted from the top compartment to the bottom compartment, but only a need to stop EMI from emanating outside of the enclosure. The circuit boards of Alexander attempt to stop such emanation by grounding the entire circuit board. As a result, the Alexander circuit board does not disclose the Claim 1 feature showing that: "one of the at least three ground layers is positioned . . . **to cover the via and substantially all of the trace that is in electrical communication with the device** in the unshielded compartment when the riser card is mounted in the computer enclosure." In view of the foregoing, Applicants submit that Claim 1 and Claims 2-11, which depend

from Claim 1, are allowable over the cited art and request that the Examiner withdraw the rejections of Claims 1-11.

In view of the foregoing, the Applicants respectfully submit that Claims 1-15 are in condition for allowance. Reconsideration and withdrawal of the rejections is respectfully requested, and a timely Notice of Allowability is solicited. To the extent it would be helpful to placing this application in condition for allowance, the Applicants encourage the Examiner to contact the undersigned counsel and conduct a telephonic interview.

Our check in the amount of $750.00 is enclosed with the accompanying RCE, pursuant to 37 C.F.R. §1.17(e). In addition, the Commissioner is authorized to charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-0639.

Respectfully submitted,

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